DYNAMIC RESOURCE ALLOCATION USING KNOWN FUTURE BENEFITS

ABSTRACT OF THE DISCLOSURE

A benefit task system implements a policy for allocating resources to yield some benefit. The method implemented may be applied to a variety of problems, and the benefit may be either tangible (e.g., profit) or intangible (e.g., customer satisfaction). In one example, the method is applied to server allocation in a Web site server "farm" given full information regarding future loads to maximize profits for the Web hosting service provider. In another example, the method is applied to the allocation of telephone help in a way to improve customer satisfaction. In yet another example, the method is applied to distributed computing problem where the resources to be allocated are general purpose computers connected in a network and used to solve computationally intensive problems. Solution of the Web server "farm" problem is based on information regarding future loads to achieve close to the greatest possible revenue based on the assumption that revenue is proportional to the utilization of servers and differentiated by customer class. The method of server allocation uses an approach which reduces the Web server farm problem to a minimum-cost network flow problem, which can be solved in polynomial time. Similar solutions are applicable to other resource allocation problems.